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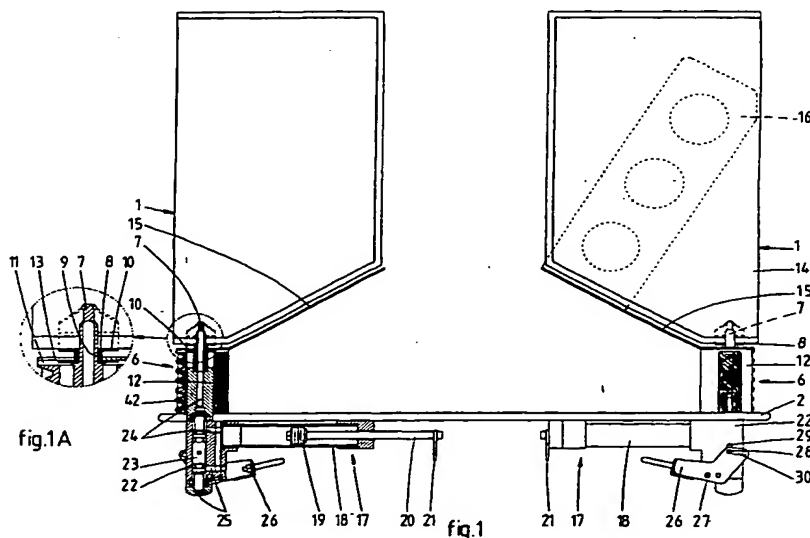
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(54) Apparatus for dispensing viscous fluids

(57) An apparatus for dispensing viscous fluids comprises a turntable (2) rotatable around an axis of rotation. A plurality of containers (1) containing the fluid to be dispensed are connected to the turntable in positions spaced about the circumference of the turntable. A plurality of pumps (17) are associated with each container for dispensing fluid therefrom and are attached to the turntable. The pumps have connectors (6) for releasably connecting the containers to the pumps. A stationary ac-

tuator (38) is positioned at the circumference of the turntable and is movable to and fro a first inoperative position disengaged from the turntable, a first operative position in engagement with one of the connectors, in which the connector is connected to the respective container, and a second operative position, in which the connector is disengaged from the container and the container may be removed and exchanged for another container.



Description

[0001] The present invention relates to an apparatus for dispensing viscous fluids, comprising a turntable rotatable around an axis of rotation; a plurality of containers containing the fluid to be dispensed and connected to the turntable in positions spaced about the circumference of the turntable; a plurality of pumps associated with each container for dispensing fluid therefrom and attached to the turntable, the pumps having connectors for releasably connecting the containers to the pumps.

[0002] Such apparatus is known in various embodiments. Problem in these apparatus is the exchange of containers, especially in case the operator is not trained to operate the apparatus.

[0003] The principle object of the present invention is to remove this problem in an effective way and to provide an improved apparatus.

[0004] To obtain the object, the invention provides an apparatus which is characterized by a stationary actuator positioned at the circumference of the turntable and being movable to and fro a first inoperative position disengaged from the turntable, a first operative position in engagement with one of the connectors in which the connector is connected to the respective container, and a second operative position, in which the connector is disengaged from the container and the container may be removed and exchanged for another container.

[0005] Due to this feature according to the invention, it is possible to use a single actuator for several containers. By rotating the turntable, the container to be exchanged is positioned in front of the actuator and by operating the actuator, it is brought into engagement with the connector and then moved to such position that the container can be removed and replaced.

[0006] It is preferred therein that the movement of the actuator to and fro the inoperative position and the first and second operative positions is done by one continuous manipulation of an actuating element, such as a handle.

[0007] In this manner the operator does not have to do anything special to operate the actuator in two different ways. One conceivable embodiment to accomplish this is to provide the connector with a toothed rack and the actuator with a toothed ring, and wherein the toothed ring and the actuating element are coupled through a transmission mechanism transmitting a substantially continuous movement of the actuating element into a consecutive translating and rotating movement of the toothed ring.

[0008] In a preferred embodiment according to the invention, the connector includes a nipple which is insertable into an opening of the container, the nipple being slidable in longitudinal direction of a holder, the holder being provided with a slit extending in transverse direction of the holder in order to introduce and fix a flange of the container to the holder with said opening aligned with the nipple.

[0009] In this embodiment, the operator only has to slide the container with its flange out of, and then another into the slit of the holder in order to exchange the containers.

5 [0010] A further improvement according to the invention is that the pumps are provided on the side of the turntable opposite to the side where the connectors are positioned, the pumps extending substantially parallel to the turntable in radial direction.

10 [0011] By positioning the pumps on the other side than the connectors, the pumps do not interfere with the containers so that there is a maximum available space on the turntable enabling the use of large containers and thereby lengthening the time between exchanges of containers. Positioning the pumps parallel to the turntable allows for a compact structure of the apparatus.

15 [0012] It is favourable if the turntable is rotatably supported by a plurality of rollers engaging the turntable at its circumference and supporting it in radial and axial directions.

20 [0013] Supporting the turntable at its circumference avoids the necessity of a shaft in the centre of the turntable which increases the maximum available space for the pumps. If one or more of the rollers is moveable to and fro the turntable, then the mounting and demounting of a turntable is facilitated.

25 [0014] According to a further aspect of the invention the pumps each include a valve which is movable between a position in which the pump may suck fluid from the container into a dosing reservoir and a position in which the pump may dispense fluid from the dosing reservoir, the valve being operable by a central gripper which has an operating stroke the ends of which being determined by sensors.

30 [0015] This embodiment simplifies the apparatus and ensures an accurate dispensing of fluid from the containers.

35 [0016] The invention will hereafter be further elucidated with reference to the drawing showing an embodiment of the invention by way of example.

40 [0017] Fig. 1 is a side view, partially sectioned, of a turntable of the apparatus according to the invention, wherein several parts have been omitted.

45 [0018] Fig. 1A is an enlarged detail of a portion encircled in Fig. 1.

[0019] Fig. 2 is a top view of the turntable of fig. 1 with all container supports shown.

[0020] Fig. 3 is a larger scale top view of the turntable with only the support means for the turntable shown.

50 [0021] Fig. 4 are sectional views of the pumping arrangement of the apparatus in fig. 1, shown in four different positions to illustrate the operation of the pump.

[0022] Fig. 5 is a side view, partially sectioned, of the operating means for the pumping arrangement of fig. 4.

55 [0023] Fig. 6, 7 and 8 are a side view, cross section and front view, respectively, of the actuator for actuating the connector in order to exchange containers.

[0024] Fig. 9 is an explosive view of the actuator of

fig. 6-8, on a larger scale.

[0025] Fig. 10 a-e are sectional views corresponding to fig. 7 illustrating the operation of the actuator through five different positions.

[0026] The drawings show an apparatus for dispensing viscous fluids, such as hair dye contained in containers, in particular flexible packages or bags 1. The apparatus is used to mix dosages from several packages 1 in order to create a hair dye of a particular recipe. In order to obtain an accurate mixture of hair dye from several containers each containing a certain dye colour, it is necessary that the apparatus is able to dispense the fluid in an accurate way.

[0027] The apparatus according to the invention comprises a horizontal turntable 2 rotatable about a vertical axis. The turntable 2 does not have a shaft in the centre of the table, but is supported by support rollers 3, 4 (fig. 3), the rollers 3 thereof being fixed and being only rotatable, whereas the rollers 4 are journaled on a slide which can be moved to and fro the rollers 3. The object thereof is to engage the circumference of the turntable 2 in order to support it in axial and radial direction, or to disengage from the turntable in order to release it for demounting purposes. In principal it would also be possible to have only three rollers, one or two of which being moveable.

[0028] In this case, the turntable 2 is adapted to contain twenty packages 1 spaced around the circumference of the turntable 2. For each package 1 there is provided a connector 6 having a nipple 7 adapted to frictionally engage into an opening of the package. For this purpose, the flexible package 1 has a rigid dispensing portion 8 through which a dispensing opening 9 extends and which may engage around the nipple 7. The dispensing portion 8 includes a flat flange 10 at its free end and this flange 10 may be inserted into a space 11 in a holder 12 of the connector 6. A slit 13 is provided to allow passage of the neck of the dispensing portion 8 of the package 1. It will be described later on how the nipple 7 and dispensing opening 9 of the package 1 are connected to each other. The dispensing portion 8 of the package 1 is connected to a storage portion 14 of the package 1. Such storage portion 14 is made of plastic foil and may be kept upright on the connector 6 by means of a bottom support 15 and side supports 16 of the connector 6. The side of the storage portion 14 of the flexible package 1 resting on the bottom support 15 and the opposite side of the package 1 is such that there are no dead spaces where fluid will be left as residu. During tests a residu of maximally 1% remained within the package 1 after emptying it.

[0029] Fig. 1, 4 and 5 show a pumping arrangement 17 connected to each connector 6 and adapted to suck fluid from the respective package 1 and to press it out in order to dispense the fluid in an accurate dosage. The pumping arrangement 17 including a piston pump comprising a cylinder 18 as dosing reservoir and a piston 19 adapted to reciprocate within the cylinder 18 and being

guided and controlled by a piston rod 20 carrying a driving lip 21 at its free end adapted to be engaged by a drive means to be described later on.

[0030] The cylinder 18 of the pumping arrangement 17 is connected to the nipple 7 of the connector 6 through a valve block 22. A pin shaped valve body 23 is slideably arranged within the valve block 22 and is slideable between a first position (fig. 4a, 4b) opening a suction channel 24 and closing a dispensing channel 25, and a second position (fig. 4c, 4d) in which the valve body 23 closes the suction channel 24 and opens the dispensing channel 25. The valve and channel arrangements are of conventional design.

[0031] The valve body 23 is operated by means of a control lever 26 which is pivotable around a horizontal pivot 27 and slideably engages with its forked end a pin 28 attached to the valve body 23 and extending through a vertical slot 29 in the valve block 22. The pin 28 engages in slots 30 on either side of the valve block 22 allowing movement between the control lever 26 and the pin 28 during vertical displacement of the pin 28 to move the valve body 23 to and fro the first and second positions. The end of the control lever 26 remote from the pin slot connection 28, 30 can be engaged by a gripper of an operating means which will be described hereafter.

[0032] Fig. 5 shows the operating means for the valve body 23 and pumping arrangement 17, the operating means including a linearly movable pump gripper 31 driveable by means of a drive spindle 32, and a rotatable valve gripper 33 which is rotatable around a horizontal pivot 34 and is driven by a crank mechanism 35. A the crank shaft 36 of the crank mechanism 35 cooperates with a sensor 37 to determine the beginning and end of the stroke of the gripper 33. The beginning and end of the stroke of the crank mechanism 35 are near the top and bottom dead centre of the crank mechanism 35 so that small variations in the start and end positions of the crank shaft have minimal effect on the start and end positions of the valve gripper 33.

[0033] The operation of the valve and pumping arrangements is as follows.

[0034] If the computer of the apparatus has determined the dosage of a fluid to be dispensed from a particular package 1, the turntable is rotated by its drive means until the respective package 1 is positioned in line with the operating means. The grippers 31 and 33 thereof come into engagement with the driving lip 21 and the end of the control lever 26, respectively. The piston 19 and valve body 23 are in the positions according to fig. 4a. Depending on the dosage to be dispensed, the piston 19 is displaced by the pump gripper 31 to the extent that the dosage to be dispensed is sucked into the cylinder 18 which serves as dosing reservoir.

[0035] In fig. 4b, the piston 19 has been moved to its maximally displaced position so that the whole cylinder has been filled with fluid. Then, the valve gripper 33 is rotated such that it moves the control lever 26 to the position according to fig. 4c and hence, the valve body

23 is moved from its position allowing suction of fluid to its position allowing dispensing of fluid. It is shown that the valve body 23 closes the suction channel 24 and releases the dispensing channel 25. Thus, if the piston 19 is now moved to its original starting position, the fluid is dispensed through a lower dispensing opening of the valve arrangement, for example into a mixing container in which the hair dye colours from the various packages are brought together and mixed.

[0036] The computer software accurately registers the original fluid content of a container and the fluid dosages dispensed so that it is known if a container is empty or almost empty. The computer signals to the operator when the contents of a package are not sufficient for a dosage to be dispensed and the apparatus may be arranged such that the operator may choose between exchanging the almost empty container for a new container, right away or using for a dosage a last portion of the almost empty package 1 together with a first portion of a new full package 1. If an empty package 1 should be removed, the nipple 7 of the connector 6 should be extracted from the dispensing opening 9 of the package 1 in order to allow the flange 10 of the dispensing portion 8 of the package 1 to be moved laterally from the space 11 in the connector 6. For this purpose, there is provided an actuator 38 including a handle 39 as actuating element and by manipulating this handle 39 the holder 12 will be engaged and will be displaced upwardly thereby displacing the package 1 and the dispensing portion 8 thereof upwardly with respect to the stationary nipple 7. As a result, the dispensing opening 9 and the nipple 7 will become disengaged thereby enabling the dispensing portion 8 of the package 1 to be moved laterally without interference by the nipple 7. After a new package 1 has been positioned with its flange 10 in the space 11 of the holder 12, the handle 39 can be moved back and the new package 1 will be connected to this connector 6.

[0037] Since there is only one actuator 38 for all connectors 6 and packages 1, the turntable 2 should be able to move freely with respect to the actuator 38 in order to bring the package 1 to be exchanged in front of the actuator 38. For this purpose, the actuator 38 should be disengaged from the turntable during rotation of the turntable. When the connector 6 is positioned in front of the actuator 38, the actuator should be brought into engagement with the connector 6 and should be able to move it up and down. Thus, the actuator 38 should be able to perform different operations/movements and for this purpose there is provided a special transmission mechanism 40 converting a substantially continuous movement of the handle 39 into separate movements of its driving means, in this case consisting of a toothed ring 41 of the actuator 38 adapted to cooperate with a toothed rack provided on the outside of the holder 12 of the connector 6.

[0038] Fig. 6-8 show the actuator 38, whereas the exploded view of fig. 9 show the various components thereof. The actuator 38 comprises a housing 43 includ-

ing side plates 44 and upper and lower mounting plates 45 and 47. The handle 39 is fork-shaped on its lower side with an auxiliary part 47. The handle parts 39 and 47 are connected to the toothed ring 41 through torsion springs 48, the ends of which engage holes in the respective facing sides of the toothed ring 41 and the handle parts 39 and 47. The toothed ring 41 is mounted on a shaft 49 and is rotatable through a limited angle with respect to the shaft 49 which is determined by the engagement of a pin 50 protruding from the shaft 49 into a circumferential slot 51 extending circumferentially in the toothed ring 41 (cf. fig. 7).

[0039] Both the shaft 49 and the handle parts 39 and 47 have a slotted hole 52, 53, respectively. The slotted holes 52, 53 extending axially are aligned with each other and are kept in relative position by fastening screws 54 fixing the handle 39 and the shaft 49 to each other. Extending through the slotted hole 52, 53 is an inner shaft 55 extending between the side plates 44 of the housing 43 and being supported thereby in a fixed manner. The handle 39, 47 is also connected to the side plates 44 through a pin slot connection including a rotatable pin 56 and a curved slot 57 in the side plates 44. The rotatable pin 56 is attached to the handle 39, 47 excentrically spaced from the slotted hole 53 therein, whereas the curved slot 57 includes a first slot portion 57' extending substantially in a direction to the mounting hole for the inner shaft 55 and a second slot portion 57" extending concentrically around the mounting hole for the inner shaft 55.

[0040] The operation of the actuator 38 will be described with reference to the various positions of the actuator 38 as shown in fig. 10a-e.

[0041] In fig. 10a, the actuator is in the inoperative position with the handle 39 in an upright position. This position is maintained by leaf springs 58 attached on the lower mounting plate 46 of the housing 43 and engaging a recess 59 in the handle parts 39 and 47. The inner shaft 55 of the actuator 38 is at a first end of the horizontally extending slotted hole 52, 53 facing the connector 6. In this position, the toothed ring 41 is disengaged from the toothed rack 42 on the holder 12. Thus, in this position the turntable is able to be rotated without interference with the actuator 38. In fig. 10a, one connector 6 is positioned in front of the actuator 38.

[0042] When the handle is pulled away from the turntable 2 and the connector 6, a rotational force is exerted on the shaft 49 as well. However, the handle 39 is unable to rotate around the inner shaft 55 since the pins 56 of the handle parts 39, 47 engaging in the slot portion 57' of the curved slots 57 prevent such rotation. The only possible movement of the handle 39 is a forward movement in which the slotted hole 52, 53 is moved with respect to the inner shaft 55 and when the inner shaft 55 has arrived at the second end of the slotted hole 52, 53 remote from the connector 6, the toothing of the toothed ring 41 has come into engagement with the toothing of the toothed rack 42 of the connector 6 and the pins 56

have left the slot portion 57' and have arrived in the concentric slot portion 57" of the curved slot 57, so that the pins 56 would now be able to perform a circular motion around the inner shaft 55.

[0043] In Fig. 10b, the handle 39, 47 is now able to rotate around the shaft 55 which is in the center of the handle and in the center of curvature of the slot portion 57". The handle 39, 47 will rotate relative to the toothed ring, thereby tensioning the torsion springs 48, until the pin 50 in the shaft 49 has reached the end wall of slot 51 in the toothed ring 41. The protruding part of the toothed ring 41 facing away from the toothing is now released from the wall of the housing 43, so that the toothed ring is now able to follow the rotation of the handle 39, 47.

[0044] From the position of fig. 10b to the position of fig. 10e, the shaft 46 and, through the pin 50 engaging the end wall of slot 51, the toothed ring 41 are rotated with the handle 39. Due to the engagement between the toothed rack 42 and the toothed ring 41, the connector 6 is moved upwardly to such an extent that the nipple 7 is disengaged from the dispensing opening 9 of the flexible package 1 so that this flexible package 1 which is empty may be removed and may be replaced by a full package. This is then engaged with its dispensing opening 9 over the nipple 7 by moving the handle 39 back to the position of fig. 10a. Due to the engagement of the nipple 7 into the dispensing portion 8 of the package, it pushes away a self-closing valve of the package, so that the package opens and closes automatically upon displacement of the nipple into or out of the dispensing portion 8 of the package 1.

[0045] The invention is not restricted to the embodiment shown in the drawing and described herein before, which may be varied in different manners within the scope of the invention.

[0046] For example, the handle may be replaced by a motor drive, such as an electric, pneumatic or hydraulic motor.

Claims

1. Apparatus for dispensing viscous fluids, comprising:

a turntable (2) rotatable around an axis of rotation;

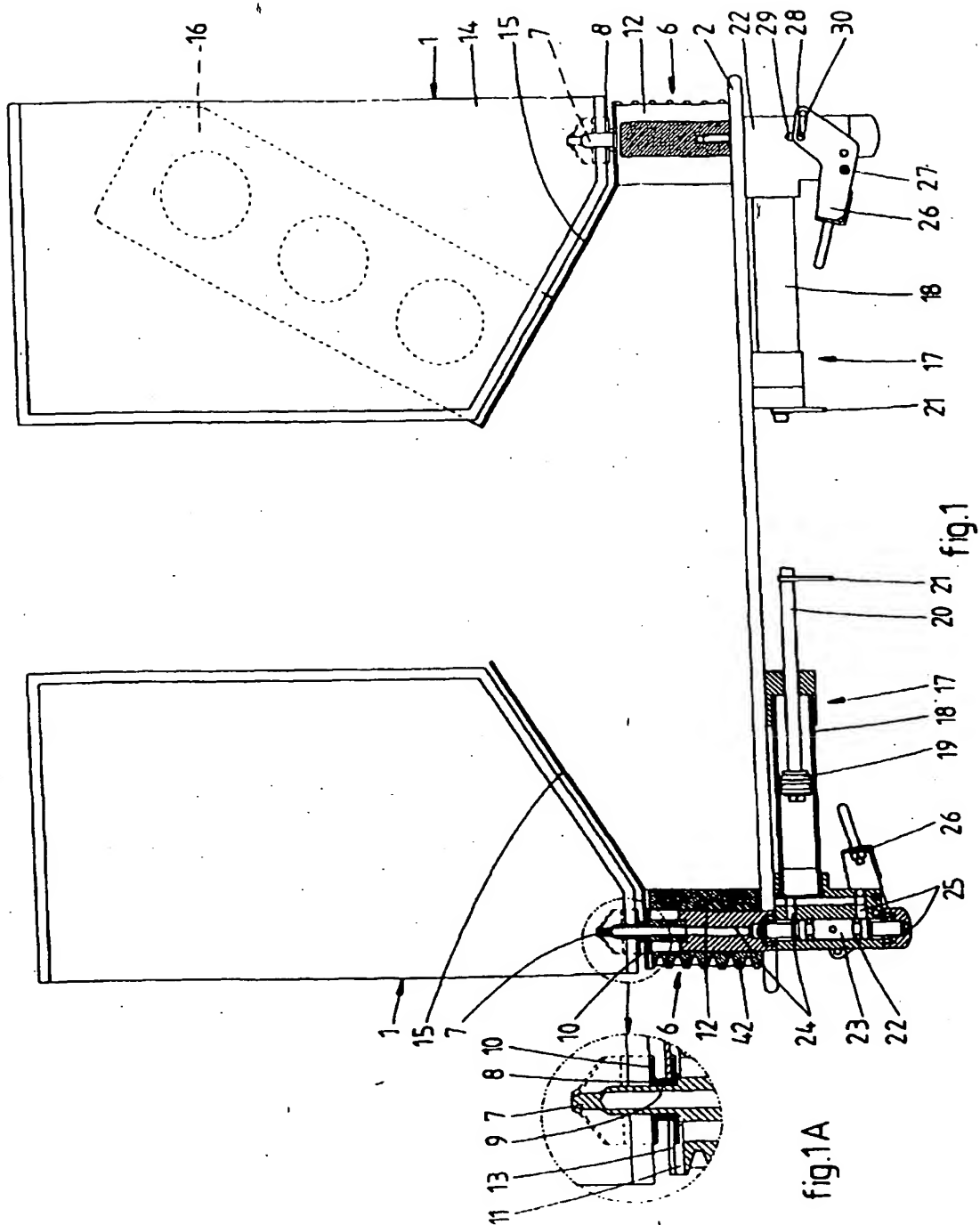
a plurality of containers (1) containing the fluid to be dispensed and connected to the turntable in positions spaced about the circumference of the turntable;

a plurality of pumps (17) associated with each container for dispensing fluid therefrom and attached to the turntable, the pumps having connectors (6) for releasably connecting the containers to the pumps;

characterized by a stationary actuator (38) positioned at the circumference of the turntable (2) and being movable to and fro a first inoperative position disengaged from the turntable, a first operative position in engagement with one of the connectors (6), in which the connector is connected to the respective container (1), and a second operative position, in which the connector (6) is disengaged from the container (1) and the container may be removed and exchanged for another container.

2. Apparatus according to claim 1, wherein the movement of the actuator (38) to and fro the inoperative position and the first and second operative positions is done by one continuous manipulation of an actuating element (39), such as a handle or motor.
3. Apparatus according to claim 2, wherein the connector (6) is provided with a toothed rack (42) and the actuator (38) is provided with a toothed ring (41), and wherein the toothed ring (41) and the actuating element (39) are coupled through a transmission mechanism (40) transmitting a substantially continuous movement of the actuating element (39) into a consecutive translating and rotating movement of the toothed ring (41).
4. Apparatus according to claim 3, wherein the transmission mechanism (40) comprises a shaft (49) fixed to a stationary support, a slotted hole (52, 53) in the actuating element (39) and the toothed ring (41) through which the shaft (49) extends, the length of the slotted hole (52, 53) being such that when the shaft is at a first end of the slotted hole, the toothed ring (41) is out of engagement with the rack (42) of the connector (6) and when the shaft is at the second end of the slotted hole (52, 53) the toothed ring (41) is in engagement with the rack (42) of the connector (6), the toothed ring and the support being further connected through a pin-slot connection (56, 57), the slot (57) having at least two segments, a first segment (57') dictating the translatory movement of the toothed ring and a second segment (57") dictating the rotary movement of the toothed ring.
5. Apparatus according to claim 4, wherein the actuating element (39) and the toothed ring (41) are rotatable with respect to each other to a limited extent and are coupled by means of a torsion spring (48).
6. Apparatus according to one of the preceding claims, wherein the connector (6) includes a nipple (7) which is insertable into an opening (9) of the container (1), the nipple being slidable in longitudinal direction of a holder (12), the holder being provided with a slit (13) extending in transverse direction of the holder (12) in order to introduce and fix a flange

- (10) of the container (1) to the holder (12) with said opening (9) aligned with the nipple (7).
7. Apparatus according to one of the preceding claims, wherein the pumps (17) are provided on the side of the turntable (2) opposite to the side where the connectors (6) are positioned, the pumps extending substantially parallel to the turntable in radial direction.
8. Apparatus according to one of the preceding claims, wherein the turntable (2) is rotatably supported by a plurality of rollers (3, 4) engaging the turntable at its circumference and supporting it in radial and axial direction.
9. Apparatus according to claim 8, wherein the plurality of rollers (3, 4) include two positionally fixed rollers (3) and one or two movable rollers (4) movable to and fro the turntable (2).
10. Apparatus according to one of the preceding claims, wherein the apparatus is adapted to cooperate with flexible packages as containers (1), the turntable (2) being equipped with supporting means (15, 16) to hold the packages in an upright position in all emptying stages.
11. Apparatus according to one of the preceding claims, wherein the pumps (17) each include a valve (23) which is movable between a position in which the pump may suck fluid from the container into a dosing reservoir (18) and a position in which the pump (18) may dispense fluid from the dosing reservoir, the valve being operable by a central gripper (33) which has an operating stroke the ends of which being determined by sensors (37).
12. Apparatus for dispensing viscous fluids, comprising:
- a turntable (2) rotatable around an axis of rotation;
- a plurality of containers (1) containing the fluid to be dispensed and connected to the turntable in positions spaced about the circumference of the turntable;
- a plurality of pumps (17) associated with each container for dispensing fluid therefrom and attached to the turntable, the pumps having connectors (6) for releasably connecting the pumps to the containers;
- characterized in that the pumps (17) are provided on the side of the turntable (2) opposite to the side where the connectors (6) for the containers are positioned, the pumps (17) extending substantially parallel to the turntable in radial direction.
13. Apparatus for dispensing viscous fluids, comprising:
- a turntable (2) rotatable around an axis of rotation;
- a plurality of containers (1) containing the fluid to be dispensed and connected to the turntable in positions spaced about the circumference of the turntable;
- a plurality of pumps (17) associated with each container for dispensing fluid therefrom and attached to the turntable, the pumps having connectors (6) for releasably connecting the pumps to the containers;
- characterized in that the turntable (2) is rotatably supported by a plurality of rollers (3, 4) engaging the turntable at its circumference and supporting it in radial and axial direction.
14. Container, preferably for use in the apparatus according to one of the preceding claims, comprising a flexible storage portion (14) made from foil material and a rigid dispensing portion (8) including the dispensing opening (9) and being attached to the storage portion (14) which tapers at least on one side towards the dispensing portion (8).
15. Container according to claim 14, wherein the dispensing portion (8) includes a self-closing valve which is openable by insertion of a nipple (7).



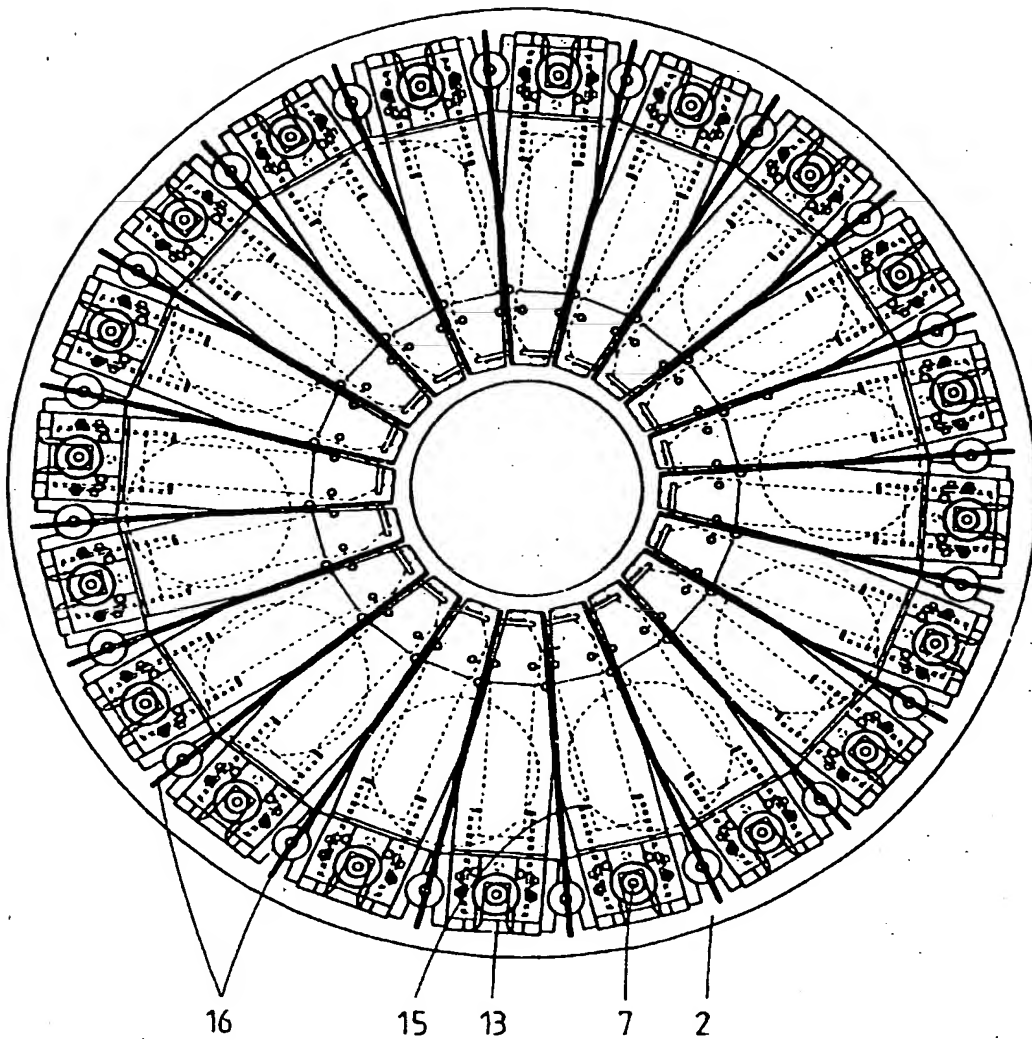
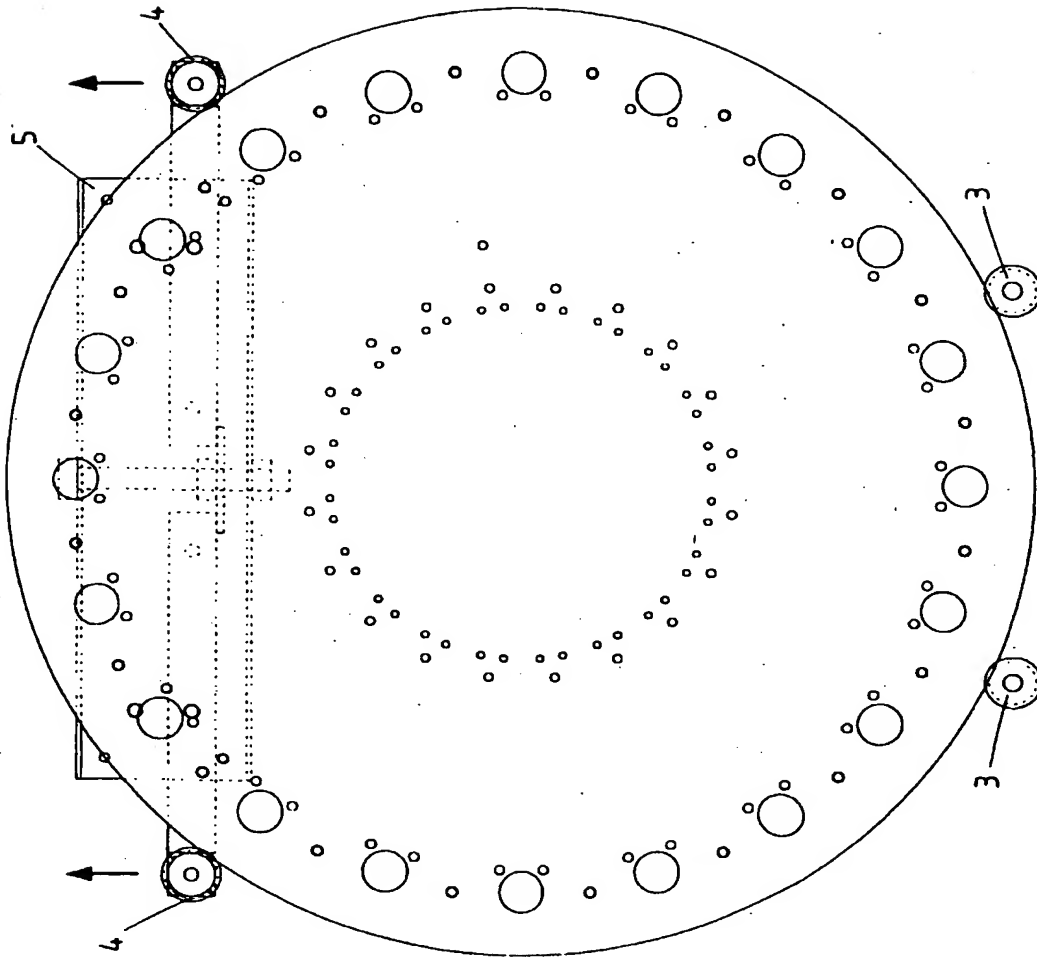
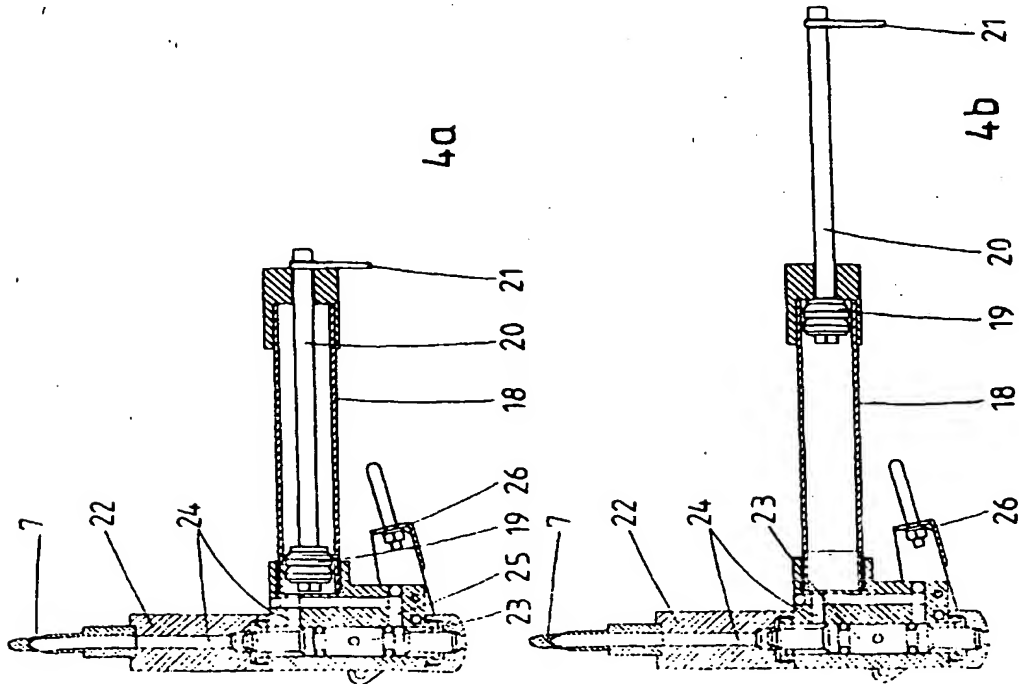
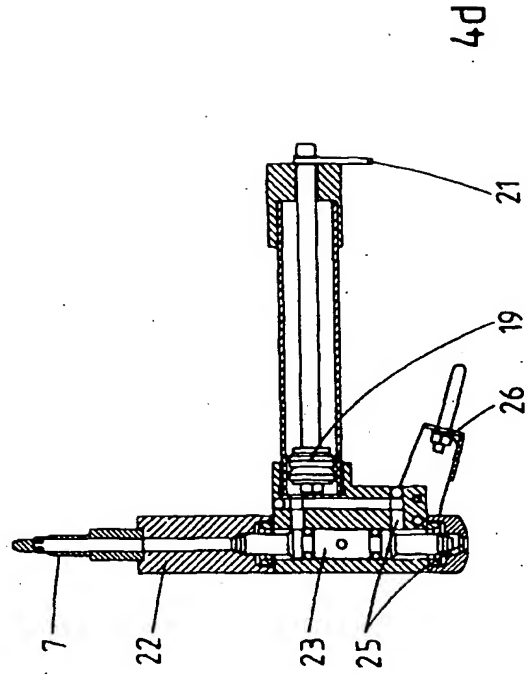
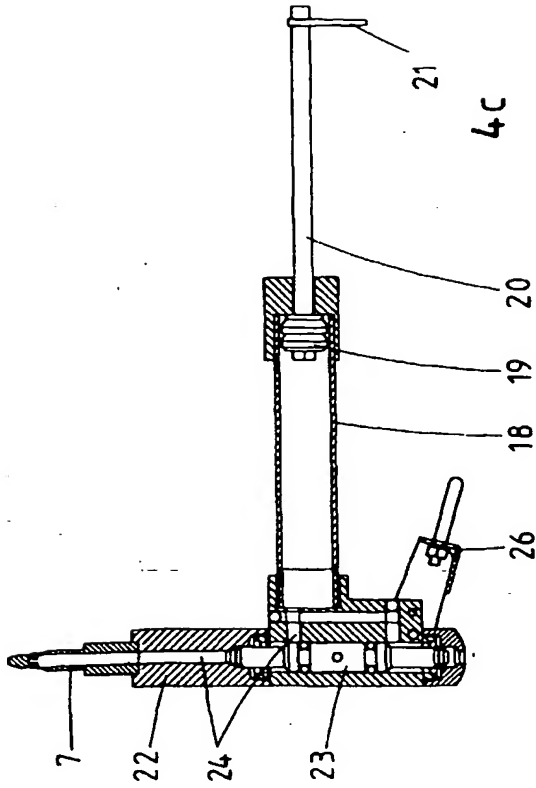


fig 2





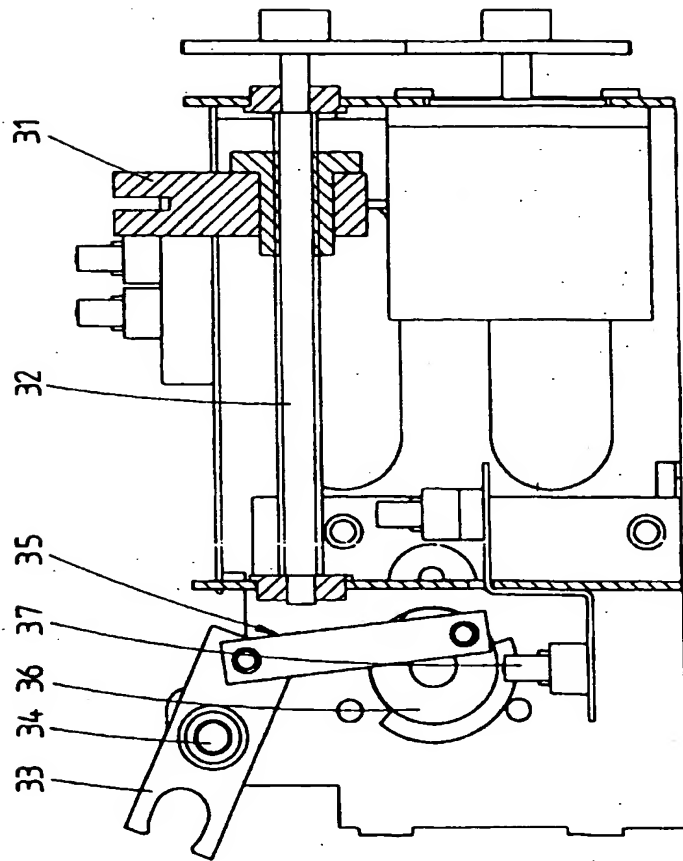


fig. 5

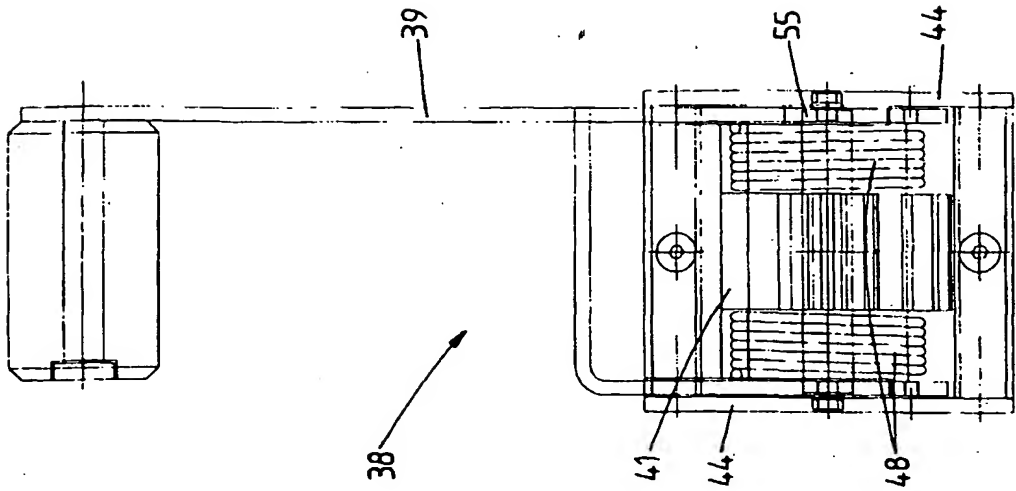


fig. 8

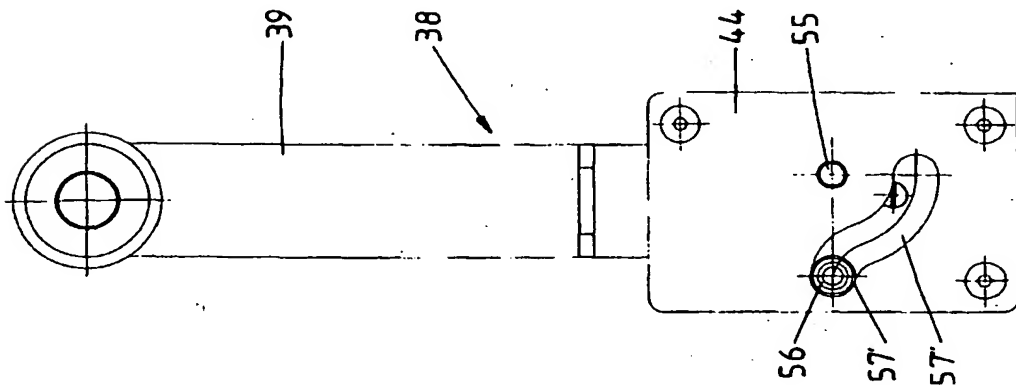


fig. 6

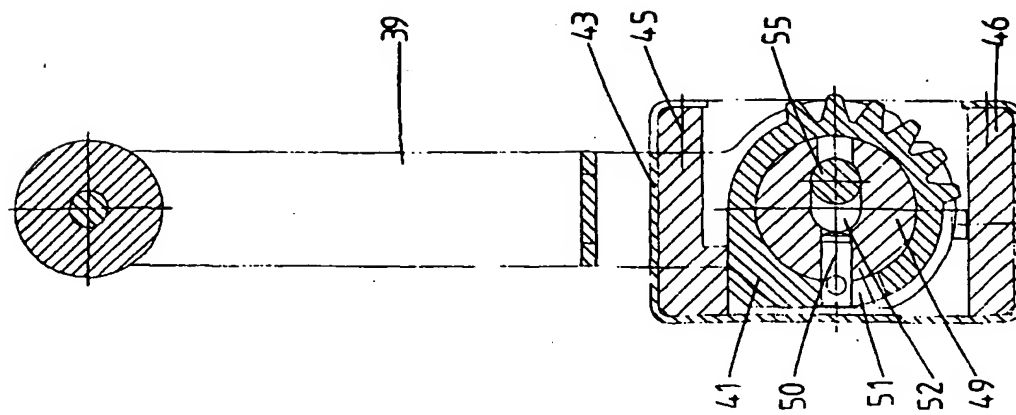


fig. 7

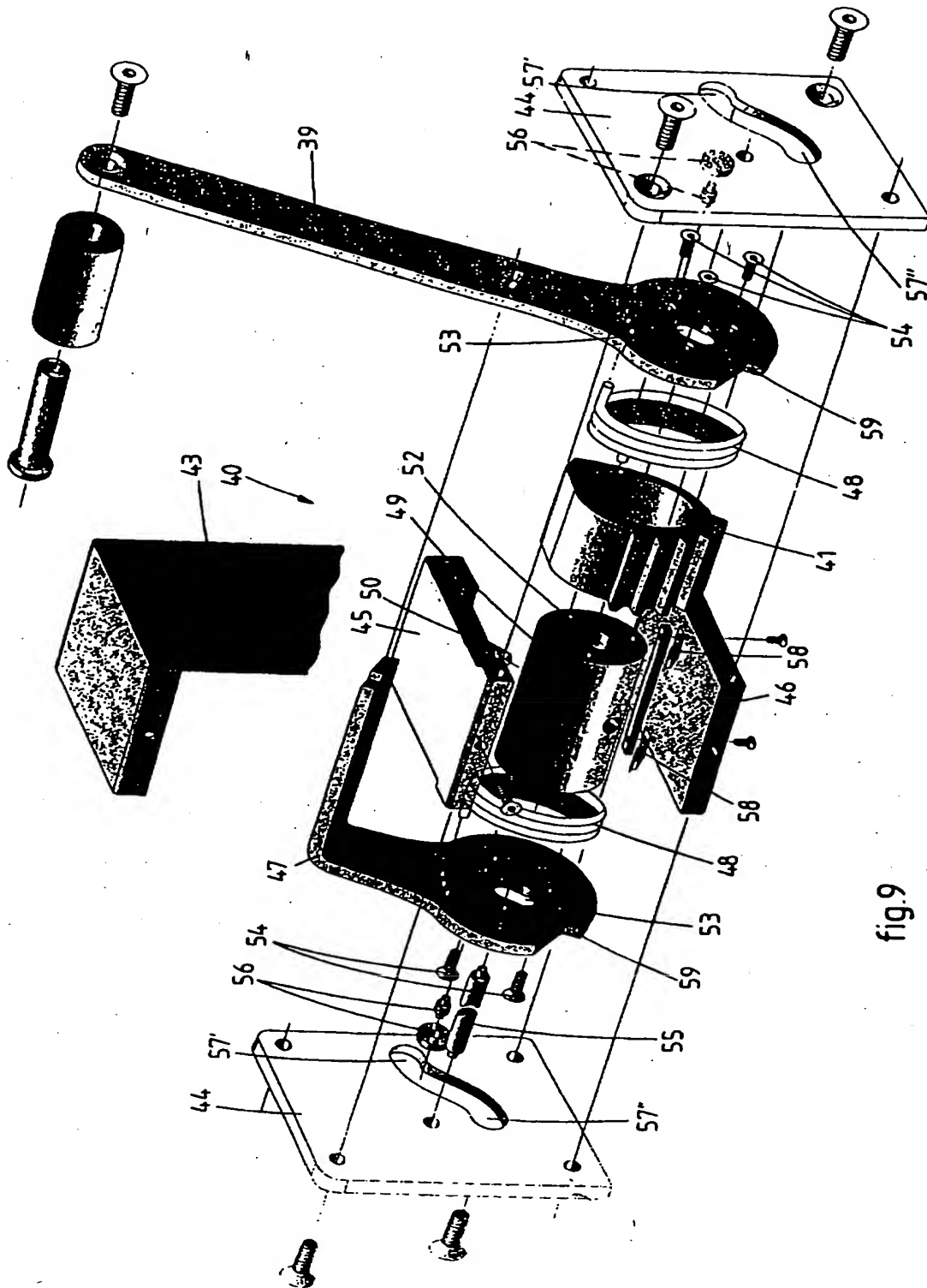


fig.9

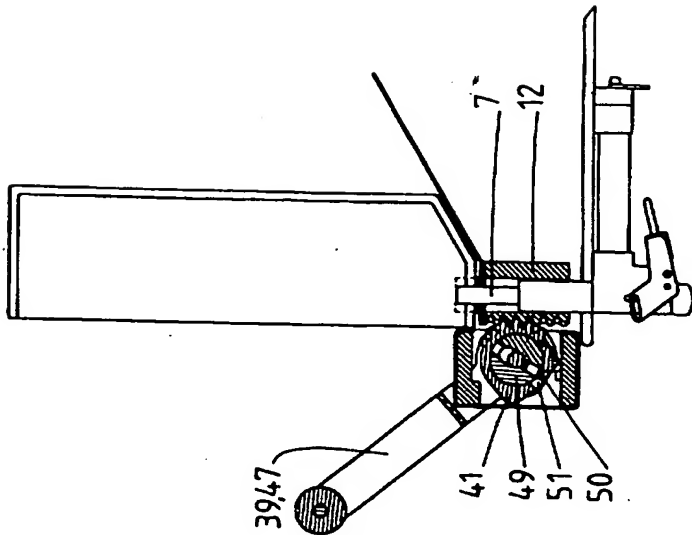


fig.10c

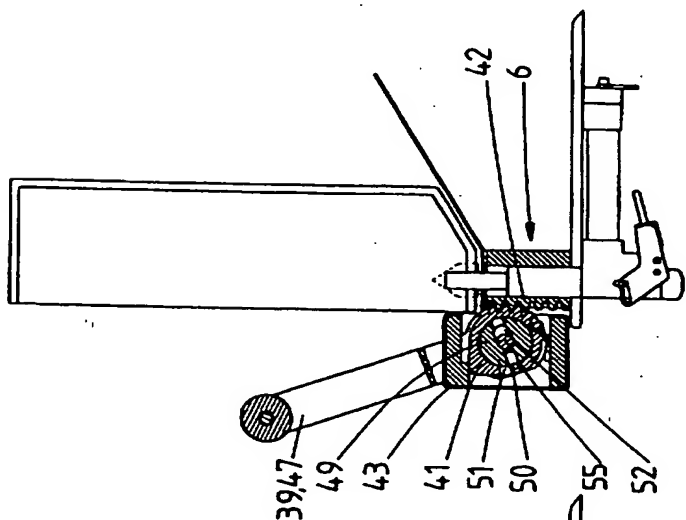


fig.10b

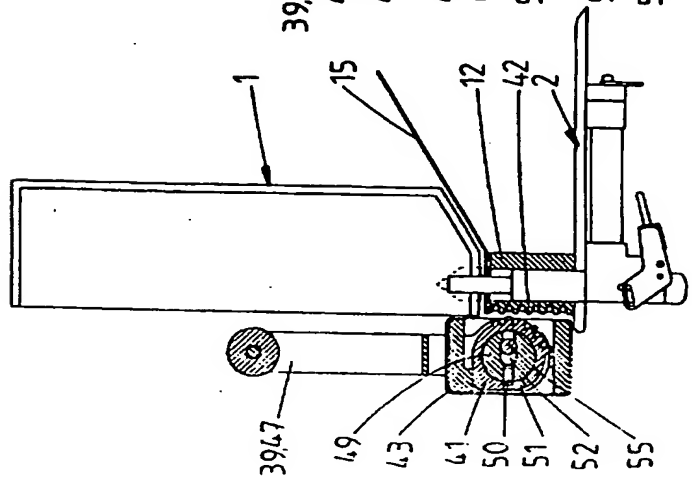


fig.10a

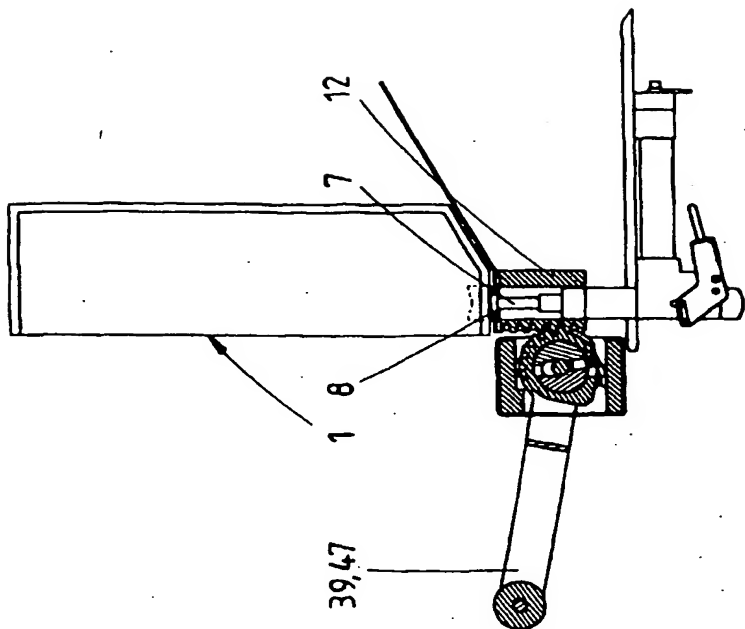


fig.10e

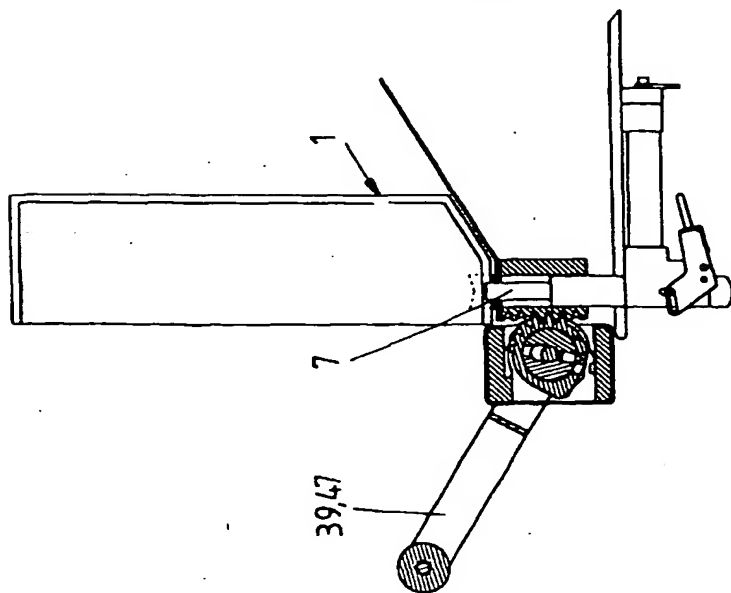


fig.10d



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 20 3225

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
A	EP 0 800 858 A (FLUID MANAGEMENT INC.) 15 October 1997 (1997-10-15) * claim 23; figure 10 *	1	B01F13/10 B67D5/46
A	GB 2 060 563 A (ARRIGONI) 7 May 1981 (1981-05-07)		
A	US 4 323 097 A (ACHEN) 6 April 1982 (1982-04-06) * column 2, line 34 - line 68; figures 1,4 *	12	
A	US 4 878 601 A (FLEMMING ET AL.) 7 November 1989 (1989-11-07) * column 4, line 43 - column 5, line 6; figure 3 *	12	
A	EP 0 372 460 A (SILVESTRI) 13 June 1990 (1990-06-13)		
			TECHNICAL FIELDS SEARCHED (Int.CI.7)
			B01F B67D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 14 June 2000	Examiner Deutsch, J.-P.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/82 (P04C01)



European Patent
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Application Number

EP 99 20 3225

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- 1-12
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



European Patent
Office

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 99 20 3225

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-11

Apparatus for dispensing viscous fluids characterised by a stationary actuator for engaging and disengaging connectors with respective containers.

2. Claim : 12

Apparatus for dispensing viscous fluids characterised by the location of the dispensing pumps.

3. Claim : 13

Apparatus for dispensing viscous fluids characterised by the turntable supporting means.

4. Claims: 14,15

Container made from a foil material and a rigid dispensing portion.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 20 3225

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

14-06-2000

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82